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Managing Snag Dependent Wildlife in a Managed Forest

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MANAGING

SNAG DEPENDENT WILDLIFE IN A MANAGED FOREST

kootenai national forest

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Managing Snag Dependent Wildlife in a Managed Forest

U.S. Forest Service
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Libby, Montana 59923

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Introduction

The Kootenai National Forest is characterized by heavily forested terrain. Landforms present include gently rolling hills, large river valley bottoms, steep mountains with high gradient stream bottoms, and rugged glaciated alpine mountains.

The timber industry is a major employer in northwestern Montana, and the Kootenai National Forest provides a significant portion of the region's annual timber harvest. On much of the Kootenai National Forest, extensive areas have lost much of their value to snag dependent wildlife due to the elimination of snags and defective trees through timber management.

Snags are used by a great variety of wildlife species for nesting, denning, perching, roosting, feeding, and cover. Forty-two species of birds and fourteen species of mammals are recognized as totally or largely dependent on snag habitat on the Kootenai National Forest (Table 1). These species are in integral part of the Kootenai's ecosystem from which our forest has evolved from. Without snag habitat, a large proportion of our small forest wildlife will perish.

Several laws now require the recognition of all wildlife species on lands administered by the U.S. Forest Service. Included are:

1. The National Forest Management Act of 1976.
2. The Resource Planning Act of 1974.
3. The Endangered Species Act of 1973.
4. The National Environmental Policy Act of 1969.
5. The Multiple Use Sustained Yield Act of 1960.

The National Forest Management Act of 1976 is specific in requiring National Forests to "develop land management plans, guidelines, and standards" including "providing for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives".

I. Goals and Objectives

A. Goal - to maintain viable populations of snag dependent wildlife species on the Kootenai National Forest.

B. Objective I - to manage for adequate habitat to sustain viable snag dependent wildlife populations.

C. Objective II - to provide land managers with the necessary information to coordinate timber harvesting activities with snag habitat.

II. Definitions (Figure 1)

Snag - Non-living or partially dead tree at least 6 inches DBH and 25 feet tall.

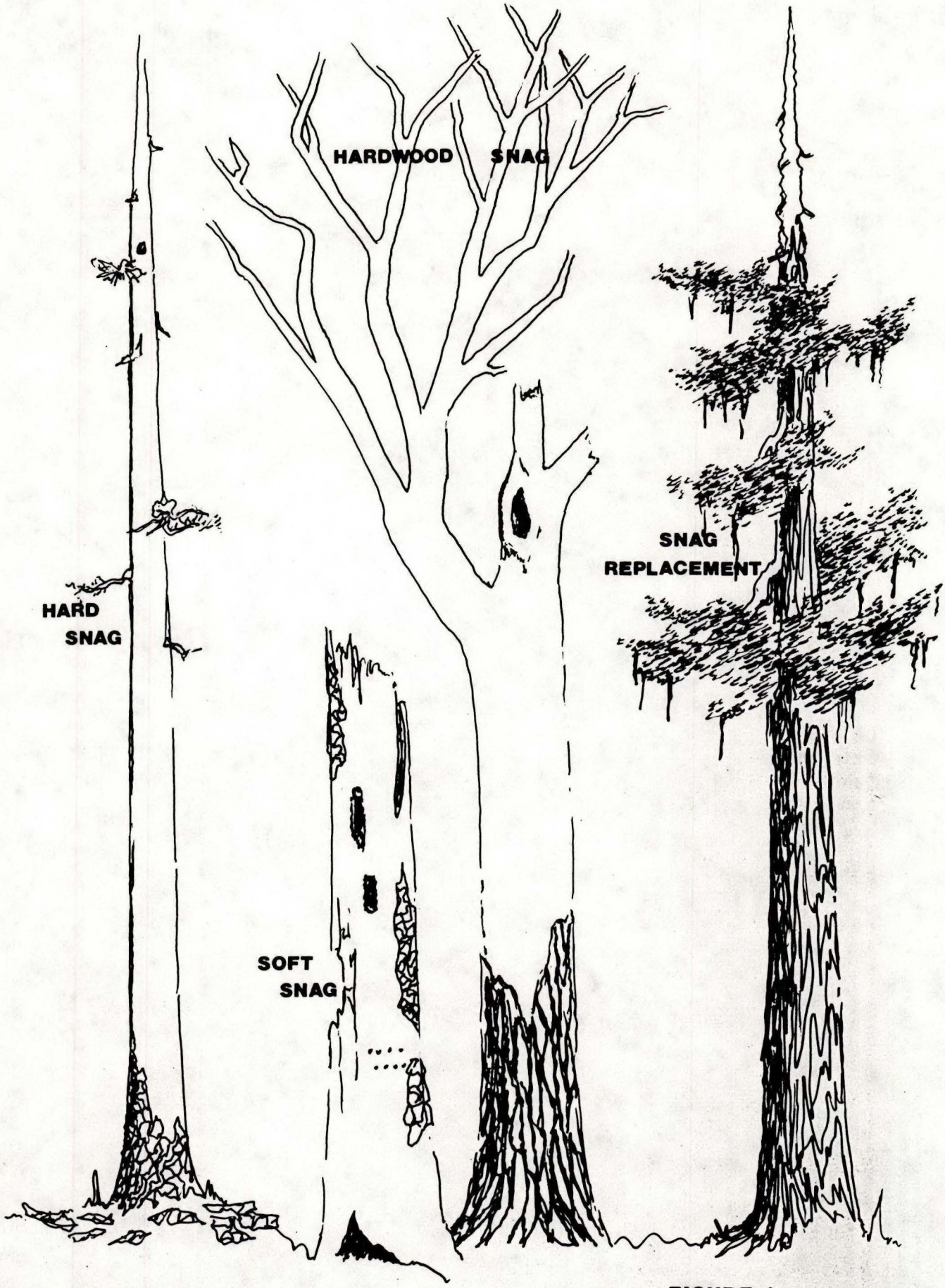

FIGURE 1

Hard Snag - Snags with a majority of the exterior surface visibly sound.

Soft Snag - Snags characterized by advance decay and deterioration (Thomas et. al., 1976).

Hardwoods - Cottonwood, birch, and aspen; important for nesting, denning, feeding, and perching.

Snag Replacement - Living or partially dead (spike-top, broken top, etc.) trees at least 6 inches DBH and 25 feet tall.

Ecotone - Transition zone between two distinct vegetation associations (Spurr, 1964).

IV. Managing Snag Habitat

Two zones are identified for managing snags (Figure 2). First, the riparian zone; includes lakes, rivers, streams, springs, bogs, and marshes. Riparian areas are lands characterized by being associated with permanent or intermittent water.

Second, the upland forest zone; includes all forested land not in the riparian zone. The upland forest zone is characterized by timbered slopes and valleys common to a majority of the Kootenai National Forest.

Figure 3 displays the relationship between the percent of the forested area meeting snag criteria and the percent of maximum

Figure 3, (Thomas et. al., 1976)

Percent of forested area meeting snag criteria	Cavity nesters - percent of potential maximum population 1/									
	100	90	80	70	60	50	40	30	20	10
Not 100	100	90	80	70	60	50	40	30	20	10
Realistic 90	90	81	72	63	54	45	36	27	18	9
80	80	72	64	56	48	40	32	24	16	8
70	70	63	56	48	42	35	28	21	14	7
60	60	54	48	42	36	30	24	18	12	6
Recommended 50	50	45	40	35	30	25	20	15	10	5
40	40	36	32	28	24	20	16	12	8	4
Marginal 30	30	27	24	21	18	15	12	9	6	3
Populations 20	20	18	16	14	12	10	8	6	4	2
Non-viable 10	10	9	8	7	6	5	4	3	2	1

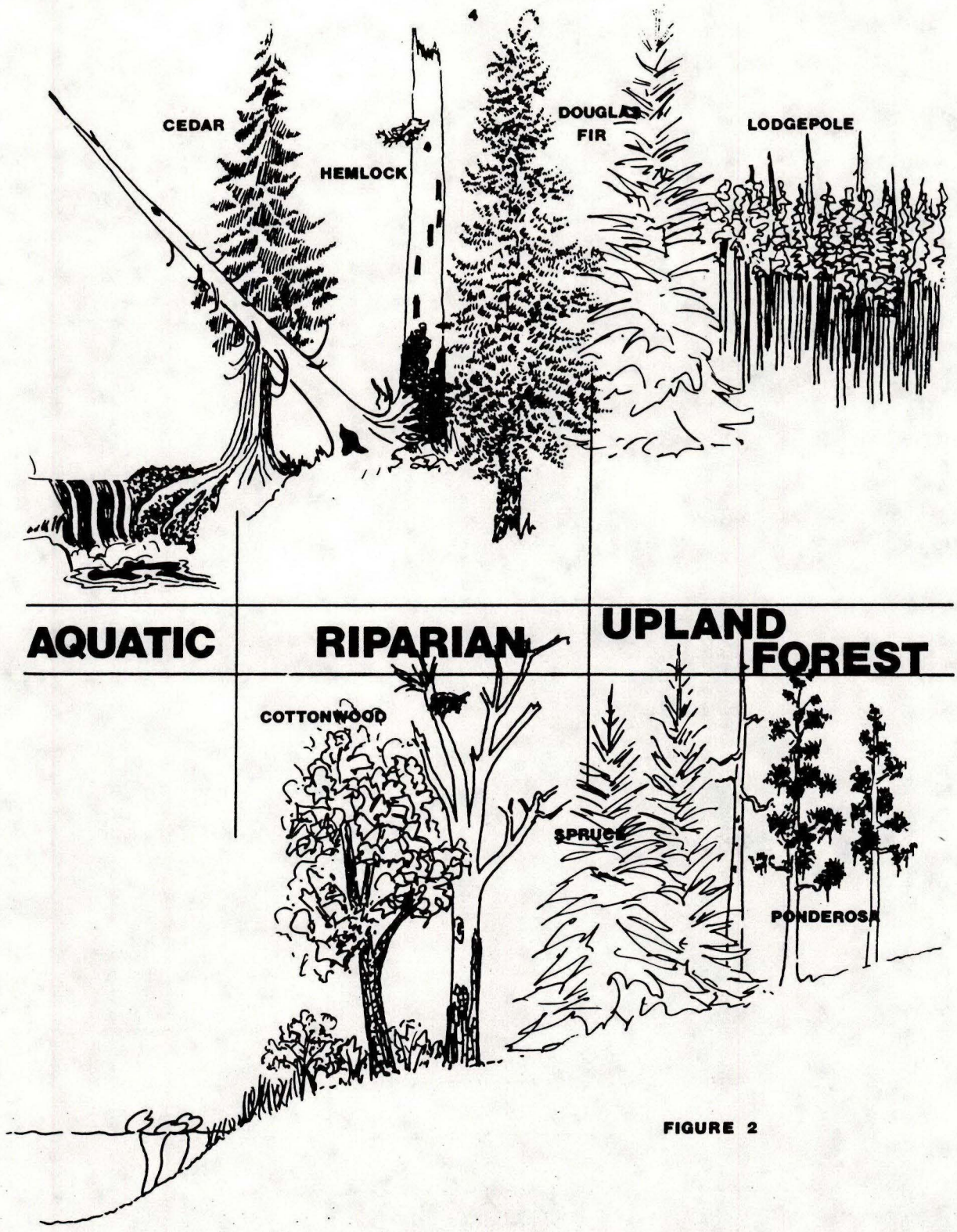
CEDAR
HEMLOCK
DOUGLAS FIR
LODGEPOLE
AQUATIC
RIPARIAN
UPLAND FOREST
COTTONWOOD
SPRUCE
PONDEROSA

FIGURE 2

population for cavity nesters (Thomas et. al., 1976). Population levels at 40 percent of maximum are considered viable. Population levels below 40 percent of maximum may not have sufficient habitat to remain part of the ecosystem under long term management. (Thomas et. al., 1976).

Tables 2-5 indicate the recommended number of snags to be managed per 100 acres. Larger diameter snags can be substituted for smaller ones. Smaller snags cannot be substituted for larger snags.

It is recommended that snag replacements be managed at a ratio of 2 (replacements):1 (snag). Snag replacement trees should be provided in all diameter classes.

Desirable tree species for snags and snag replacements, listed in order of priority are:

1. Larch or hardwoods
2. Douglas-fir
3. Ponderosa pine
4. Cedar
5. Lodgepole pine
6. Spruce and fir

A. Managing Snag Habitat in the Riparian Zone

The riparian zone is particularly rich in wildlife. Many species nest only in or adjacent to the riparian zone. The diversity and density of snag dependent wildlife is highest in this zone. Osprey, blue heron, and many species of waterfowl usually nest in riparian habitat. Since trees are often large in the riparian zone, pileated woodpeckers commonly nest here.

Generally, vegetation found in the riparian habitat is characterized by either broadleafed shrubs and deciduous trees or cedar or hemlock forests. In the case of small streams this zone may be less than twenty feet wide on each side of the stream. Ponds with marshy borders, large rivers and lakes, and bogs may have riparian zones fifty yards or wider.

Because the riparian zone is so rich in wildlife diversity and densities, emphasis has been placed within this zone to manage for snag dependent wildlife.

Table 2:

Hard snag numbers recommended for the riparian zone - lakes and rivers:

Snag Size (DBH)	Recommended Snags/100 Acres	Percent Maximum Population Level
20 in.	15	100
12 in.	94	70
10 in.	53	70
6 in.	105	70
Total	267	80

Table 3:

Hard snag numbers recommended for the riparian zone - ponds, bogs, streams:

Snag Size (DBH)	Recommended Snags/100 Acres	Percent Maximum Population Level
20 in.	12	80
12 in.	94	70
10 in.	53	70
6 in.	105	70
Total	264	75

B. Managing Snag Habitat in the Upland Forest Zone

Most of the Kootenai National Forest will be in the Upland Forest Zone. A majority of the timber harvesting takes place within this zone. Because of this, the potential to lose snag habitat is high. Many species such as the black-backed three-toed and northern three-toed woodpeckers have adapted to conditions naturally present in the upland forest zone.

Table 4:

Hard snag numbers recommended for lodgepole pine and alpine fir stands:

Snag Size (DBH)	Recommended Snags/100 Acres	Percent Maximum Population Level
12 in.	48	80
10 in.	96	80
6 in.	75	50
Total	219	60

Table 5:

Hard snag numbers recommended for Douglas-fir-ponderosa pine, grand fir, cedar, hemlock, and spruce stands:

Snag Size (DBH)	Recommended Snags/100 Acres	Percent Maximum Population Level
20 in.	11	70
12 in.	67	50
10 in.	38	50
Total	116	60

C. Managing Snags to be used by Wildlife

Wildlife have evolved in nature to fill certain niches. This means that each wildlife specie requires a certain type of habitat, and generally no two species occupy the same niche. If a snag management program is to be effective, it should provide habitat to the entire spectrum of wildlife which require snags.

Wildlife use snags to fulfill different life requirements (Table 1). Several wildlife species require snags for food. Some can excavate cavities (woodpeckers) while others require cavities for nesting but do not have the capability to excavate them. These species are dependent upon woodpeckers to provide suitable nest sites. Many wildlife species use a variety of tree sizes for nesting and feeding habitat, while others such as the pileated woodpecker, cavity nesting waterfowl, owls, and larger denning wildlife require relatively large trees (over 20 inches) for habitat. Certain species such as the osprey, eagles, blue heron, barn owl, and red-tailed hawk construct nests on top of snags.

Broken-top trees often make the best snags for snag dependent wildlife (McClelland, 1977). Snags and snag replacements with broken tops are recommended over those without broken tops.

Large snags along lakes and rivers which have a commanding view over water and surrounding terrain are favored by osprey. Snags on points or peninsulas are often utilized.

Snags left along ecotones, such as cut and uncut areas or riparian and nonriparian habitat are often utilized by wildlife.

Some wildlife prefer or require groups or clumps of snags. The pileated woodpecker often will nest in a clump of large snags in a dense forest situation and the northern three-toed and black-backed three-toed woodpeckers nest primarily in clumps of snags in alpine fir or lodgepole pine stands. In lodgepole pine stands it is recommended most snags be left in clumps rather than as individual trees. These clumps may be one-half to two acres in size.

The hairy woodpecker and Lewis' woodpecker prefer individual snags in openings.

Snags or snag replacements should be at least 25 feet or taller (McClelland, 1977).

Hard snags are used primarily for nesting and denning, while soft snags are used for feeding. Carpenter ants and a variety of other insects used as food are associated with wood decay present in soft snags.

Literature Cited

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3. Thomas, J.W., R. Anderson, C. Maser, and E. Bull. 1976. Dead Tree (Snag) Requirements for Dependent Wildlife Species in the Blue Mountains of Washington and Oregon. Unpublished. 73 pp.

TABLE 1. Species and their Association with Ecological Zones and Snags

	Occurrence by Ecological Zones				Uses of Snags				
Species	Riparian Zone	Douglas fir Ponderosa Pine Zone	Cedar-Hemlock-Spruce-Grand Fir Zone	Lodgepole pine Alpine fir Zone	Cavity Excavator	Cavity Nester	Snag Nester	Roost or Perch tree	Food Source
Pileated Woodpecker	X	X	X		X	X		X	X
Red Shafted Flicker	X	X	X	X	X	X		X	X
Lewis' Woodpecker	X	X			X	X		X	X
White-headed Woodpecker		X	X		X	X		X	X
Yellow-bellied Sapsucker	X				X	X		X	
Williamson's Sapsucker		X	X		X	X		X	
Hairy Woodpecker		X	X	X	X	X		X	X
Downy Woodpecker	X				X	X		X	X
Black-backed three toed Woodpecker		X		X	X	X		X	X
Northern three-toed Woodpecker				X	X	X		X	X
Wood Duck	X					X			
American Golden-eye	X					X			

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Barrow's Golden eye	X					X			
Bufflehead	X					X			
Common Merganser	X					X			
Hooded Merganser	X					X			
Kestrel	X	X	X			X			
Screech Owl	X					X		X	
Flammulated Owl		X	X			X		X	
Saw-whet Owl	X	X	X	X		X		X	
Pigmy Owl		X	X			X		X	
Vaux's Swift			X	X		X		X	
Violet-green Swallow	X	X				X			
Tree Swallow	X	X				X			
Black-capped Chickadee	X	X				X		X	
Mountain Chickadee		X	X	X		X		X	
White Brested Nuthatch		X	X			X		X	
Red Brested Nuthatch			X	X		X		X	

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Pygmy Nuthatch		X				X		X	
House Wren	X	X	X	X		X			
Western Bluebird		X	X			X		X	
Mountain Bluebird		X	X			X		X	
English Sparrow	X					X		X	
Starling	X	X				X		X	
Canada Goose	X						X		
Mallard	X						X		
Red-tailed Hawk	X	X					X	X	
Golden Eagle	X	X					X	X	
Bald Eagle	X	X					X	X	
Osprey	X	X					X	X	
Barn Owl	X	X	X				X		
Little Brown Myotis	X	X	X	X		X		X	
Yuma Myotis	X							X	
Long-eared Myotis	X	X	X	X		X		X	
Long-legged Myotis	X	X	X	X		X		X	

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Silver-haired Bat	X	X	X	X		X		X	
Big Brown Bat	X	X	X	X		X		X	
Martin			X	X		X			
Fisher	X		X	X		X			
Shorttail Weasel		X	X	X		X			
Longtail Weasel	X	X	X	X		X			
Yellow Pine Chipmunk	X	X	X	X		X			
Red Squirrel		X	X	X		X			
Deer Mouse	X	X	X	X		X			
Northern Flying Squirrel	X	X	X	X		X			
Total in Zone	38	37	30	22					
% in Zone	69%	67%	54%	40%					